

TELLOFAX 95

CENTRAL INTELLIGENCE AGENCY

INFORMATION REPORT

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Report Referenced in Attachment

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REPORT

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SUPPLEMENT TO  
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LABORATORY LAYOUT

1. I have drawn a sketch showing the laboratory layout after the 1949 move [see page 7]. Dr. GOERLICH occupied the cell laboratory and was in charge of this particular room. [redacted] in the design office [redacted] Otto RITTER [redacted] was engaged in work on the so-called "Juno Geraet" (an infrared device) [see Footnote 1, page 5] up to about 1949. Crystals were grown in the crystal laboratory by Dr. STRAUBEL, but I can give no information as to the types of crystals involved.
2. A move took place in 1949 whereby the laboratory site formerly occupied by the Germans was taken over by the Soviets. I [redacted] cannot describe the facilities the Soviets obtained. I believe the Soviets continued after 1949 to improve these facilities. The facilities available to the Germans

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in the new laboratory site were rather meager, and we had to borrow equipment from the former laboratory taken over by the Soviets. Twenty-three people were working in the design office under the direction of Hermann SCHRUMPF, who delegated tasks given him by the Soviets to the German engineers. The only infrared activity known to me was RITTER's project, but I did not become familiar with any details of RITTER's work.

3. The mechanical shop had only standard mechanical equipment, which included lathes, milling machines, drill presses, etc. There were no special facilities for fabrication of optical components, such as comparators, etc. Design engineers had parts made in the mechanical shop. These parts were assembled in the shop to form a final device, under the supervision of the project engineer. Finished equipment was turned over to the Soviets. [ ] was very vague on this point.
4. The optical laboratory tested objectives and had apparently managed to retain reasonable facilities in spite of the move. Facilities included grinding machines and polishing machines but no measurement devices. The optical shop was primarily concerned with making lenses for the Contax.

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LABORATORY OF DR. GOERLICH

5. Dr. GOERLICH's cell laboratory was in a room about 15 x 7 meters, on the left side of which were located three vacuum systems, 50 cm. wide and 60 cm. high. I have drawn a simple sketch showing the plan of this laboratory [see page 8]. There were three tables in this room. Dr. GOERLICH's table, which was in the rear, served also as his desk. A small darkroom with an optical bench of 150 cm. maximum length was located in one corner. I saw several photocells in the darkroom and observed measurements being conducted there on these cells with a 600° C Black Body serving as radiation source. I also observed a Black Body for 300° C. I cannot give any details regarding their construction. [See paragraph 10]. Also located in the laboratory was an oven for oxidation of photocells. I cannot recall the facilities in GOERLICH's laboratory in detail as my visits to the room were infrequent, sometimes only once in several months. I did not observe any optical instruments such as tripods, mirrors, etc.
6. The following personnel were directly associated with Dr. GOERLICH: Dr. Alfred GROSS; Fraulein HEINE (who later became Frau GOERLICH); two glassblowers, Werner HARTMANN and VANDENHERZ; and a Dr. GAENEWEIN. Only one of the vacuum systems was at GOERLICH's disposal. GOERLICH had to share the room with Herbert FUCHS, who worked on lens coatings using one of the vacuum systems; a Dr. Harold STRAUBEL, who was in charge of the crystal laboratory; and a Herbert RIESE. FUCHS is now chief of personnel at Zeiss Jena. While GOERLICH was in charge of the room, Dr. STRAUBEL, FUCHS and RIESE did not report to him but had other Soviet supervisors. RIESE made mirror seatings, using the third vacuum system.
7. GOERLICH was frequently summoned by Soviets unknown to me and disappeared into the Soviet laboratory. I cannot give any indication as to the length or frequency of such visits. At one time GOERLICH was visited by a Soviet, Dr. TOLSTOY, in connection with work on the

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tau-meter (facility for measuring photocell time constant). TOLSTOY is allegedly a Soviet expert in the photocell field. The only additional information that I can give on Dr. TOLSTOY is that he had personally constructed a photocell time constant measuring device and that there was a Russian description of it in the laboratory. This was not necessarily the first or only such visit by Dr. TOLSTOY to GOERLICH. I saw Dr. TOLSTOY only once, in 1951, but knew that he had been there more often. I feel that GOERLICH was not overly happy in the USSR. He often indicated his desire to return to Germany. The Soviets did not praise GOERLICH in any special way nor did they treat him as a "fair-haired boy." I do not believe that GOERLICH had any special relations with the Soviets or any special privileges during his stay there. Most of the time he did just what was required of him and concerned himself with preparations for his book. The facilities at GOERLICH's disposal were insufficient for any elaborate research activities. I can give no opinion, one way or another, as to whether GOERLICH might have acted as supervisor or consultant to a group of 10 or 15 Soviet employees in the Soviet laboratory, making periodic checks over them and their performance or acting as a trouble shooter up to the time when he was no longer essential. I believe that GOERLICH was mostly interested in scientific findings, and that GOERLICH's prime interest was in his cells rather than in equipment using these cells.

8. [ ] two tau-meters, one of which was for Dr. GOERLICH, and the other for the Soviets. [ ] only a few photocells at any particular time in GOERLICH's laboratory, and never [ ] large quantities. I definitely had the impression that there was a decrease in activity with respect to fabrication of lead sulphide cells in GOERLICH's laboratory towards the end of his stay in the USSR and that the Soviets had by that time acquired the necessary know-how and could continue unassisted. [ ] GOERLICH personally making measurements on cells, [ ] might know more about this subject. I know that GOERLICH resumed his work on photocells upon his return to Zeiss Jena, but can give no further details.

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INFRARED SENSITIVE PHOTOCELLS

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9. In GOERLICH's laboratory and also on RITTER's table, [ ] lead sulphide cells; they resembled the cooled Elac cell which was used in the Kiel IV device and other long-range detection equipment (Elac Waer-speilgeraet, for instance). I have described the cell, and drawn a sketch of it [ see page 9 ]. There is a hollowed-out glass cylindrical structure with a sensitive surface of a bluish gray appearance deposited on the inner front surface. I did not observe any cell holders but did see shiny protective jackets and a spring-loaded plunger associated with a cell which fits into the cell. I estimate that a total of 200 - 300 cells were fabricated in GOERLICH's laboratory since 1949. I never saw these cells built into an instrument nor did I observe any mounting ring. I had seen cells earlier but did not learn until 1949 that these were PbS cells. I cannot describe the process for making these cells, but I feel the cells were chemically deposited rather than evaporated.

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BLACK BODIES

10. Willy ROEGER built a number of Black Bodies for different temperatures, including 300° C, some of which were for GOERLICH. Several of these Black Bodies were built for the Soviet laboratory. I cannot describe the Black Bodies in detail, but have indicated their general appearance by a sketch [see page 10]. Black Bodies were constructed by ROEGER even before I had heard about photocells.

GENERAL ATMOSPHERE IN THE GERMAN LABORATORY

11. I have no knowledge regarding activities in the Soviet laboratory after the move of the Germans to their new location since the Soviet laboratory was too distant for any observation. I never observed any personnel working on the roof of the Soviet laboratory and can offer no information on material being brought in or out of the Soviet installation. I never saw any large equipment the size of half a desk in the design office. [redacted] Note: The Kiel IV equipment used the identical cells and is about this size. As far as I was concerned, all plans which [redacted] were generally made in the design office, were turned over to Hermann SCHRUMPF, and I do not know what SCHRUMPF did with them. I know that [redacted] Soviet officers and civilians came and looked at the device. In the laboratory proper there were primarily civilians and very few military people. I had the impression that the Soviets were quite capable people who knew what they wanted and did not depend on handouts of information from the Germans. I never saw military personnel actually working there wearing white smocks. [redacted] Comment: Recent intelligence reports claim this took place in one plant. I never saw any servo mechanisms or servo mechanism components.

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JUNO DEVICE

12. RITTER had already been working at Zeiss on the so-called "Juno Device", which was a seeker for guided missiles, and [redacted] the name, "Juno Device", mentioned frequently. There was relatively little collaboration between GOERLICH and RITTER, although occasionally [redacted] the two talking together. There was more collaboration between RITTER and the elektro-laboratory. On the other hand, there was collaboration between the elektro-laboratory and GOERLICH. RITTER was active on the Juno device until 1948/49, then had little to do with it. [redacted] never saw the device or any of its components. [redacted] the device on which RITTER was working was actually the responsibility of the electrical shop, which was also staffed by Zeiss people. They built a laboratory-type amplifier for GOERLICH, but I cannot give any further details on this shop.

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Comments: [redacted]

[redacted] report gives the first positive clue that work on passive detection by means of infrared photocells was being carried on in the USSR. The photocell described [redacted] is definitely of a similar type as the Elac cooled photocell, which was used for instance in the Kiel IV Geraet<sup>2</sup>. The Juno device mentioned [redacted] was a seekerhead for guided missiles which utilizes a lens-mirror system and slotted disk modulator system for two-dimensional

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control which was of an entirely different construction mechanically than the Kiel Geraet. It is not clear at this time whether the Juno or the Kiel IV is actually involved. It is understood that RITTER had been working at Zeiss with the Kiel Geraet. The use of the Black Bodies of low temperature indicates positively that passive detection was attempted. Of particular importance is the fact that GOERLICH's facilities since 1949 were quite modest and that GOERLICH had not been at the head of a large organization dealing with infrared as had been supposed. Instead GOERLICH was apparently put on ice after all information he had was taken from him, and was returned to Germany when there was no further use for him in the USSR. GOERLICH was then not very busy and spent much time writing his book. This would explain the many requests GOERLICH mailed out during that period for reprints of material dealing with photo emissivity and photo conductivity. It appears thus that our previously held belief that GOERLICH would be well qualified to give an estimate of Soviet progress and capabilities in the infrared field is still correct. However, he himself seems to have played a relatively minor part during the last few years in the Soviet infrared effort.

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Footnote 1:

Description of German Homing Missile Heads Utilizing Zeiss Optics.

- a. Wasserfall is a lens mirror system, with a lead sulphide photocell. The field is divided into four quadrants each of which is obscured by two revolving shutters to give a pair of characteristic frequency interruptions. Each shutter wheel has two sets of spokes spaced at different frequencies and each set travels over half the aperture. The circumference of the two wheels are at right angles where they pass over the aperture. Thus the quadrant in which the target falls is defined by the frequency characteristic of the signal and the mechanism responds accordingly by correcting the course of the missile.
- b. Linse is a system similar to Wasserfall but applies to a self-steered boat and therefore had only one revolving shutter, creating a left - right coordinate system with characteristic frequencies. Instead of mirrors, Linse has lenses of aperture 1: 0.85 f - 3.6 cm. Of the 50 which were delivered at the end of 1944, 10 had lenses of lithium fluoride; 40 had lenses of KRS -5.
- c. Juno is a system similar to Linse but with two-dimensional control. One variant had two shutter disks and one lens; another has two lenses placed at the ends of mutually perpendicular radii of a single shutter disk.
- d. Krebs and Sammler are lens mirror systems, with similar modulation schemes to Wasserfall.

Footnote 2:

The German Kiel Geraet was originally designed as a bomber exhaust detector for night fighters. Zeiss, Jena, received orders for 50 Kiel devices in the autumn of 1944 from Dr. PLUMEYER of OKL. Twenty to thirty of these were delivered to the German Air Force. Tests were made at Rechlin and a squadron at Goslar was fitted. The main difference of Kiel I, II, III and IV was in the field of view. After

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some minor modifications [redacted] and the use of more sensitive amplifiers, this identical Kiel IV has become currently the work horse [redacted] for passive detection of both air and ground targets. It is in use by the Air Force and the Signal Corps for experimental purposes and can be considered a highly useful instrument.

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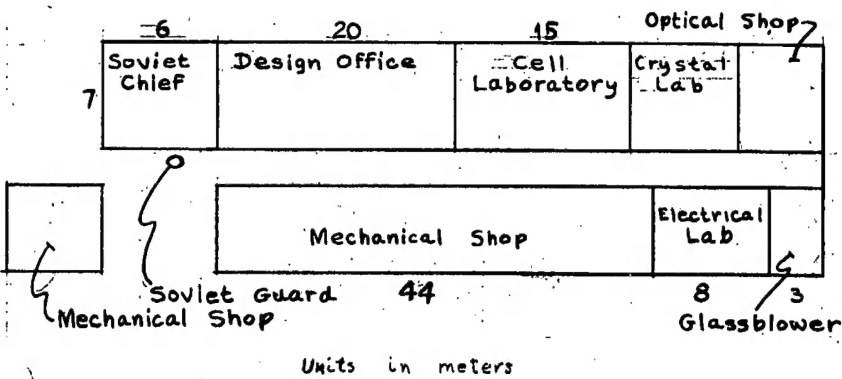
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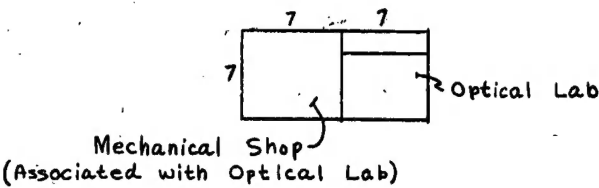
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Associated with the above rooms but further away on same floor were rooms shown below.



GENERAL LABORATORY LAYOUT

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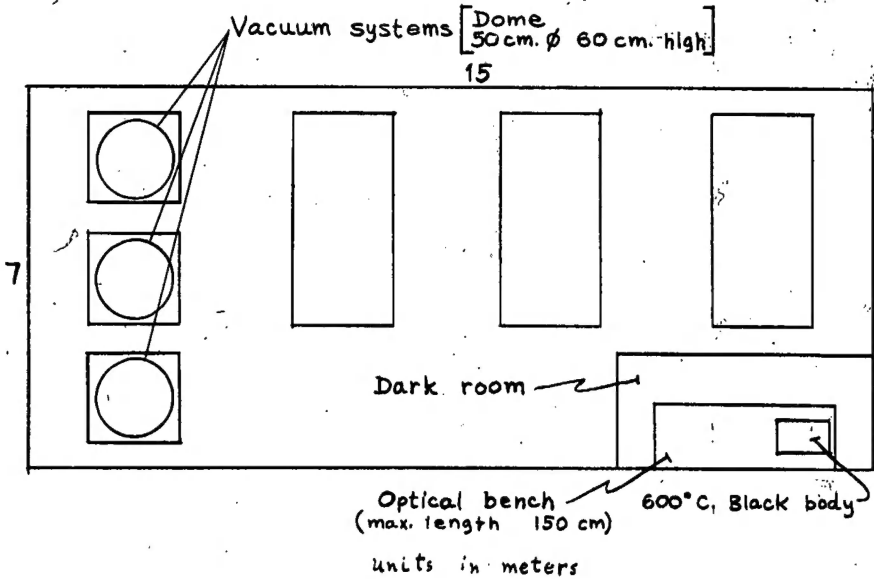


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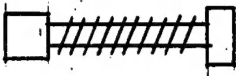
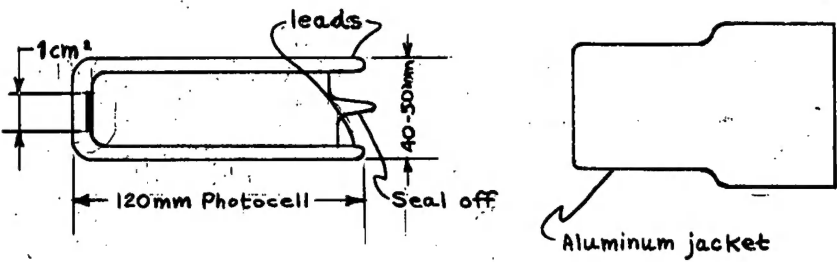
LABORATORY OF DR. GOERLICH

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Plunger for dry ice

INFRARED SENSITIVE CELL

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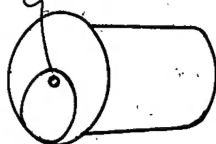
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Believed aperture to be 1cm



ROUGH SKETCH OF BLACK BODY  
(As Seen By Source)

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